

**We Claim:**

1. A composition comprising:
  - (a) a polymerization accelerator comprising a biocompatible functional group;
  - 5 and
  - (b) a polymerizable material.
2. The composition of claim 1 further comprising a polymerization initiator.
- 10 3. The composition of claim 2 wherein the polymerization initiator comprises a photoinitiator group.
4. The composition of claim 3 wherein the photoinitiator group is a long-wave ultra violet- or visible light-activatable molecule.
- 15 5. The composition of claim 1 wherein the polymerizable material comprises a macromer.
6. The composition of claim 5 wherein the macromer is selected from the group
- 20 consisting of water-soluble macromers.
7. The composition of claim 5 wherein the macromer is present at a concentration in the range of 0.5 – 50 wt%.
- 25 8. The composition of claim 7 wherein the macromer is present at a concentration in the range of 1 – 30 wt%.
9. The composition of claim 1 further comprising an acceptor or reductant.

10. The composition of claim 1 wherein the biocompatible functional group is selected from phosphonate ( $\text{PO}_3^-$ ), sulfonate ( $\text{SO}_3^-$ ), carboxylate ( $\text{COO}^-$ ), hydroxyl (OH), albumin binding moieties, and phospholipid moieties.

5 11. The composition of claim 1 wherein the biocompatible functional group comprises a sulfonate group.

12. The composition of claim 1 wherein the polymerization accelerator comprises an N-vinyl group having an N-vinyl nitrogen.

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13. The composition of claim 12 wherein the polymerization accelerator comprises a carbonyl carbon.

14. The composition of claim 13 wherein the polymerization accelerator comprises an N-vinyl amide group.

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15. The composition of claim 12 of the N-vinyl nitrogen is an atom in a heterocyclic ring.

16. The composition of claim 1 wherein the polymerization accelerator is able to react with the polymerizable material to form a polymeric matrix having biocompatible properties.

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17. The composition of claim 1 wherein the polymerization accelerator is present in an amount sufficient to improve the biocompatibility properties of the polymeric matrix.

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18. The composition of claim 1 wherein the polymerization accelerator is present in an amount sufficient to promote formation of the polymeric matrix.

19. The composition of claim 18 wherein the polymerization accelerator is present at a concentration of 0.05 wt% or greater.

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20. The composition of claim 19 wherein the polymerization accelerator is present at a concentration in the range of 0.05 – 1.0 wt%.

21. A composition comprising:

- 5           (a) a polymerization accelerator comprising:  
            i) a biocompatible functional group and ii) an N-vinyl group; and  
            (b) a macromer,

wherein the polymerization accelerator is able to be reacted with the polymerizable material to form a biocompatible polymeric matrix.

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22. A method comprising the steps of:

- (a) placing in contact with a surface at least the following materials:  
                (i) a polymerization accelerator comprising a biocompatible  
                functional group;  
15           (ii) a polymerizable compound; and  
                (iii) a polymerization initiator; and  
            (b) activating the polymerization initiator to promote formation of a  
            biocompatible polymeric matrix on the surface.

20   23. The method of claim 22 where, in the step (a), the polymerization initiator is placed in contact with a biological surface.

24. The method of claim 23 wherein the biological surface comprises the surface of tissue or cells.

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25. A method for cell encapsulation comprising the steps of:

- (a) placing in contact with one or more cells at least the following materials:  
                (i) a polymerization accelerator comprising a biocompatible  
                functional group;  
30           (ii) a polymerizable compound; and  
                (iii) a polymerization initiator; and

(b) activating the polymerization initiator to promote formation of a biocompatible polymeric matrix on the one or more cells.

26. Cellular material encapsulated with a biocompatible polymeric matrix, wherein the biocompatible polymeric matrix is formed by the polymerization of material comprising:
- (a) a polymerization accelerator comprising a biocompatible functional group; and
  - (b) a macromer.
27. A medical device coated with a polymeric matrix formed by the polymerization of material comprising: (a) polymeric material and (b) polymerization accelerator comprising a biocompatible functional group.